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72. VISUAL PURPLE, THE NEXT GENERATION CRISIS MANAGEMENT DECISION TRAINING TOOL

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INTRODUCTION

No one should have to face a crisis without proper training. For years, pilots have relied on flight simulators to ensure realistic, top-quality training. Unfortunately, this type of training and simulation has not existed for first responders and their leaders who must prepare for all types of crisis and consequence management especially chemical or biological terrorism. With proven technology, Visual Purple (VP) develops and deploys interactive, video rich, computer-based role-playing simulations designed to increase and to accelerate the ability of individuals to make appropriate crisis-related decisions. Visual Purple's stand alone or Internet deployed simulations (described by some as "interactive movies) leverage role-playing and its time-proven effectiveness for immersing individuals in an realistic, information-intensive, and challenging world where key decision-making is exercised in accordance with preferred procedures, theory and doctrine. Up to now, civilian first responder training has consisted of little more than traditional classroom lectures – decidedly inefficient and expensive. Now with VP's products, the learner is immersed in an information-intensive and challenging simulation environment, forcing many decisions, and demonstrating the consequences resulting from those decisions. Incorrect or untimely decisions within the simulation can often results in disaster, just as in the real world—but without the real world costs! Visual Purple's technology-based training simulations accelerate the mastery of complex material and increase performance in decision making by simulating the high stress of making decisions with life and death implications while having incomplete, or conflicting information. Numerous government reports have highlighted the requirement for improved training and simulations. This is the design principle recently addressed by General William W. Hartzog, USA (ret). If a simulation can offer conditions that are more stressful than the live environment but are still realistic, why would we not want to pursue the 'overload' principle for at least a portion of, if not for all of, our preparation?¹

MATURITY OF VISUAL PUPPLE'S SIMULATION TECHNOLOGY

Role-playing is a time-proven, effective means for employees to exercise decision-making in accordance with preferred procedures, theory and values of the organization. VP's products fully engage the learner within an information-intensive and challenging simulation environment, forcing many decisions, and demonstrating the consequences resulting from the logical pathway selected. Visual Purple packages its services and products in the form of consulting services for course content creation, software licenses for stand-alone CD and DVD-based simulation products and with usage-based, turnkey, web-hosted, Application Service Provider ("ASP") arrangements. Visual Purple's multi-path decisional simulations set the standard for realistic training engagement. There is nothing else like it in the marketplace. These features make VP's training simulations not only user-friendly, but fun:

- realistic full-motion video,
- sound and text messaging computed dynamically ("on-the-fly"),
- accurate intervening informational inputs (either canned or injected contemporaneously from the web),

- a user interface rich in stimuli,
- information collection and tracking capabilities to help a user remember, synthesize and apply to the next decision what he or she has learned thus far,
- hot-links to client-defined, catalogued source authorities and supplementary glossary and descriptive material, and
- the ability to keep the simulation "evergreen" with accurate terminology, acronyms, and place names.

Under Visual Purple's web-based system, a Java-based applet/application provides a graphical user interface for the interactive video content. The applet is truly "thin", and can achieve "zero footprint" in a browser environment where the network bandwidth is good. In situations where the network bandwidth is slow, or if the customer wishes to separate content from scenario logic for security reasons, the applet has the ability to access raw local assets used by any training scenario. This, coupled with the inherent communications security already provided by Java, ensures a responsive and well-protected training session.

MATURITY OF VISUAL PURPLE'S MODELING TECHNOLOGY

Previous Experience with Similar Efforts in Modeling. Visual Purple retains rights to certain technology under United States Patent #5,326,270. Mr. David L. Ostby, one of the Patent's three inventors, was responsible for the project's genesis, scope, direction and management. The research encompassed the creation of custom software and the assessment of over 300 individuals in a controlled laboratory environment. Their data was statistically analyzed and formed the basis upon which the patent was granted. A later implementation of the technology came in 1996 with the release of an entertainment business simulation title by Tsunami Media, Inc., *Free Enterprise*. The title incorporated a "light" implementation of the technology described in the patent and was dubbed, I², or Interactive Intelligence. The I² technology allows the simulation player the option of "injecting" one's cognitive strategies into "Sims" - characters within the simulation. This allowed simulation characters the ability to emulate cognitive strategies in a manner designed to create a more realistic simulation.

Current Modeling Applications. Visual Purple may implement the I² technology in many ways depending on the client's needs. Some of the more conventional applications of this technology empower the simulations to adapt to a user's unique decision-making style in real-time. In essence the simulation plays the user, creating an individualized experience. Other general applications of the technology can provide insightful feedback on an individual's decision-making style, useful in screening and selecting trainees for future assignments. Basically, as the simulation proceeds, a digital recording is made of the participant's choices and actions. This recording, or data-stream, is passed through patented algorithms for either collection or feedback into the simulation.

VISUAL PURPLE PROJECT APPROACH

Content research and validation is key to ensuring accurate information resulting in and realistic scenario development. In addition to the client experts, the Visual Purple team relies on both formal and professional education, and real-world experience in domestic and international counter-terrorism. They have amassed a comprehensive database of source material, and are conversant in the subject matter. Over 45 experts were used on the recent law enforcement project. To translate the accurate information into a meaningful training tool, Visual Purple employs the talents of professional Hollywood screenwriters during the scripting and writing process of the simulations. Additionally, cinematic techniques learned in the filmmaking industry are brought to bear during the production phase of Visual Purple's simulations, resulting in a quality unprecedented in the industry. Finally, the simulations can

be tailored to meet the delivery and security needs of the client. Visual Purple's simulations can be accessed on CD-ROM, DVD, across a LAN or the Internet. They can employ an Application Service Provider (ASP) system that when combined with CDs can eliminate bandwidth restrictions, guarantee a high level of security and a high-fidelity experience for the user. To meet international needs for simulation, Visual Purple has teamed with the Global Technology Applications (GTA) company. GTA augments the Visual Purple team with the necessary content, cultural, and language experts for research development. Additionally, GTA provides country specific support in script writing and cinematic resources as required.

THE RBIT SOFTWARE ENGINE

The key to Visual Purple's simulations is its Reality-Based Interactive Training (RBIT) proprietary software engine. The engine allows the simulation to stream video and audio images on-the-fly, essentially rendering an "interactive movie," in which the simulation role player is immersed. The RBIT software engine permits the simulation to present multiple onsets, and an almost infinitely variable menu of opposition forces actions. After viewing numerous counter-terrorism and WMD simulations, the consensus of multiple government agencies: Visual Purple's simulations are "far more sophisticated" than any other product in the market place. The technology of the overall RBIT Software Engine can be broken down into three parts: the Animation Engine (interface, video, XML), the core RBIT Engine and the Communication Engine. The third part is the glue that binds the first two together and includes the web, server and other technology. Looking at figures 1 and 2, screen captures of the tool in action, the modular strength of the RBIT is apparent. This approach is one of the key cost saving features of Visual Purple's training since it allows for rapid prototyping of the scenario, identification of the necessary video (VT) clips and can be used later by script writers, animators and directors as a program management tool.

COST-EFFECTIVE TRAINING

Visual Purple's approach to scenario development and production provides many cost benefits to the clients. In addition to the rapid prototyping mentioned above, the project planning ensure that the expensive filming and animation modules are not begun until the scripts are thoroughly vetted by the client and outside experts. By using the latest Hollywood discoveries, Visual Purple has developed techniques to reduce the costly filming portion ever more. With the Visual Purple tools, the experienced Visual Purple programmers can work in English while the content experts can develop the script and scenario in whatever necessary language. Many of the cost savings are not as easily quantified as others. Although one obvious training effectiveness is the savings in time and costs associated with live training. Further, only a very few actually benefit from participation in live training (a lot of standing around for most), many more will benefit from using a Visual Purple simulation. Technology-based training does not require specialized sites and can be conducted in an individual's office on a commonly available PC. Since this is often the actual place where the decision-making skills are required during a crisis and/or consequence management this begins to approach the "embedded" simulations that are the long term goals of the military. General Hartzog's description of the various simulations and my assessment of Visual Purple's current capabilities are contained in Table 1. It shows that the Visual Purple current state-of-the-art is on par with flight simulators and the future military goal of embedded simulators can be met once the Visual Purple decision modular (discussed below) is added to the simulation.

LAW ENFORCEMENT CASE HISTORY

In 1997, as the various law enforcement agencies continued to look for new means to accomplish their counterterrorism mission a senior official realized that the technology in a computer game called *Silent Steel* (created by what became the Visual Purple development team) offered a new method for teaching and training. In the game, video clips are woven together to create a complicated story. The player assumes the role of a submarine captain whose submarine and crew face threats from two countries' submarines. As captain, the player then directs his crew to take various actions, and either revels in his success or watches helplessly as the enemy wins.

Law enforcement decided to adapt this technology for training their officers. To this end, Visual Purple produced a simulation for preparing law enforcement officers for radiological, biological and chemical scenarios involving the American homeland. In the first of three simulations designed for local/national law enforcement, participants must respond to a terrorist threat involving a radiological dispersal device. The participant must also learn how to effectively manage the vast resources at his or her disposal (see a simplicity organizational wiring diagram in figure 3²) while limiting adverse reactions from the public. The simulation utilizes a video collection of training footage, specially prepared acting sequences, and a vast library of relevant material from law enforcement and other government sources. The result is an entirely new dimension of realism that traditional exercises often fail to capture.

The scenario requires the participant to make the tough calls as a potential crisis unfolds, for better or worse. Twenty completely different beginnings can lead to over 160 different outcomes with varying degrees of success or failure. The simulation demands strict adherence to both the rules of law and common sense. Actions require contacting the proper agencies and then waiting for these resources to be deployed. And while the participant makes his decisions, the terrorists are watching. If operational security is breached, for example, the "bad guys" may change strategy or even launch the attack ahead of schedule! The program acts like an attentive instructor, who monitors the progress of his students and adjusts the scenario to make lessons more valuable. The learning process continues even when the scenario is completed, by providing a critical "feedback" function. This feature identifies each step of the participant's decision-making process, objectively critiques performance and offers solutions for the future. By incorporating these learning points into his or her thinking, the individual becomes more innovative and adaptive to future challenges.

FUTURE DECISION AID MODULE

Visual Purple is preparing to go to the next logical step in its simulation tools development, decision aid support. During the process of simulation development, wide ranging information and facts are collected from national and international experts and reference material. Using this expert-knowledge developed for the scenarios and the vast reference information digitized into the simulation, Visual Purple can develop a decision aid module that will meet the needs of its clients. The module can be as sophisticated as desired by the client, ranging from being a simple reminder tool (i.e. "Did you notify the hospital of possible agent contaminated casualties?") to a digital "intelligent assistant" that monitors the crisis as it unfolds (i.e. all communications, situations developments, information queries, etc.) and can act as another team "member." It can operate in several different modes. For example it can be developed to remain waiting in the background until called upon to recommend a course of action. Another more active design would have the module interject a recommended course of action if certain previously approved criteria is met. This would

insure all factors are considered during the "heat of battle." In any case, the client would have extra value from the information and expertise used to develop its decision training simulation.

CONCLUSION

The Counter- Chemical and Biological Terrorism training challenges facing all nations at the national, state and local government agencies are formidable. However, funding and time constraints limit traditional answers to this problem. Visual Purple's revolutionary, yet proven technology will provide 21st century solutions to 21st century challenges. Visual Purple has developed an exciting learning simulation tool that has unlimited replay ability and is scalable to meet the needs of its clients. Painstakingly researched and using Hollywood techniques of screenwriting and film production, Visual Purple's simulations are unique in the industry. After solving the multi-language/cultural training challenge of collation forces, and bringing increased training with overall reduced training costs, Visual Purple is ready to embark on development of decision support systems to meet domestic and international client's needs.

REFERENCES

1. Hartzog, William W. General, U.S. Army (ret) Armed Forces Journal, Training and Simulation 2000/ Winter 2000/ page 5.
2. The United States Interagency Domestic Terrorism Concept of Operations Plan

KEY WORDS

Computer simulation, decision aid, crisis and consequence management, emergency planning

FIGURES AND TABLES

Table 1. Simulation Categories

Categories	Definitions	Military Hardware Examples	Crisis Management Training
Strap-on Devices	Item that can be added to fighting platforms to depict scenarios or to provide an emulation of that piece of equipment's combat capabilities	Infrared infantry firing simulators	Table top exercises
Re-Configurable Simulator	These are computer-based devices that can be tailored either electronically or digitally to emulate a weapon system.	Artillery firing signatures used by counter fire artillery radar.	Visual Purple's new product, <i>Lethal Sky</i> , for hospital executive training to deal with the aftermath of terrorist NBC use.
Stand-alone Device	These systems are nearly as complex as the fighting platform itself and are designed to teach complex life and death skills/decisions	Pilot flight Simulators	Visual Purple's current products for the U. S. law enforcement.
Embedded System	Integrated so that the systems operator can truly use the primary machine interface points to activate the simulation.	Some of the projected fire and control systems aboard new naval ships.	Visual Purple's "Decision Aid Module" being developed in 2001
Table 1. Simulation Categories	(Based on Reference 1)		

Figure 1. Screen Capture of RBIT Tool Showing Branching Decisions

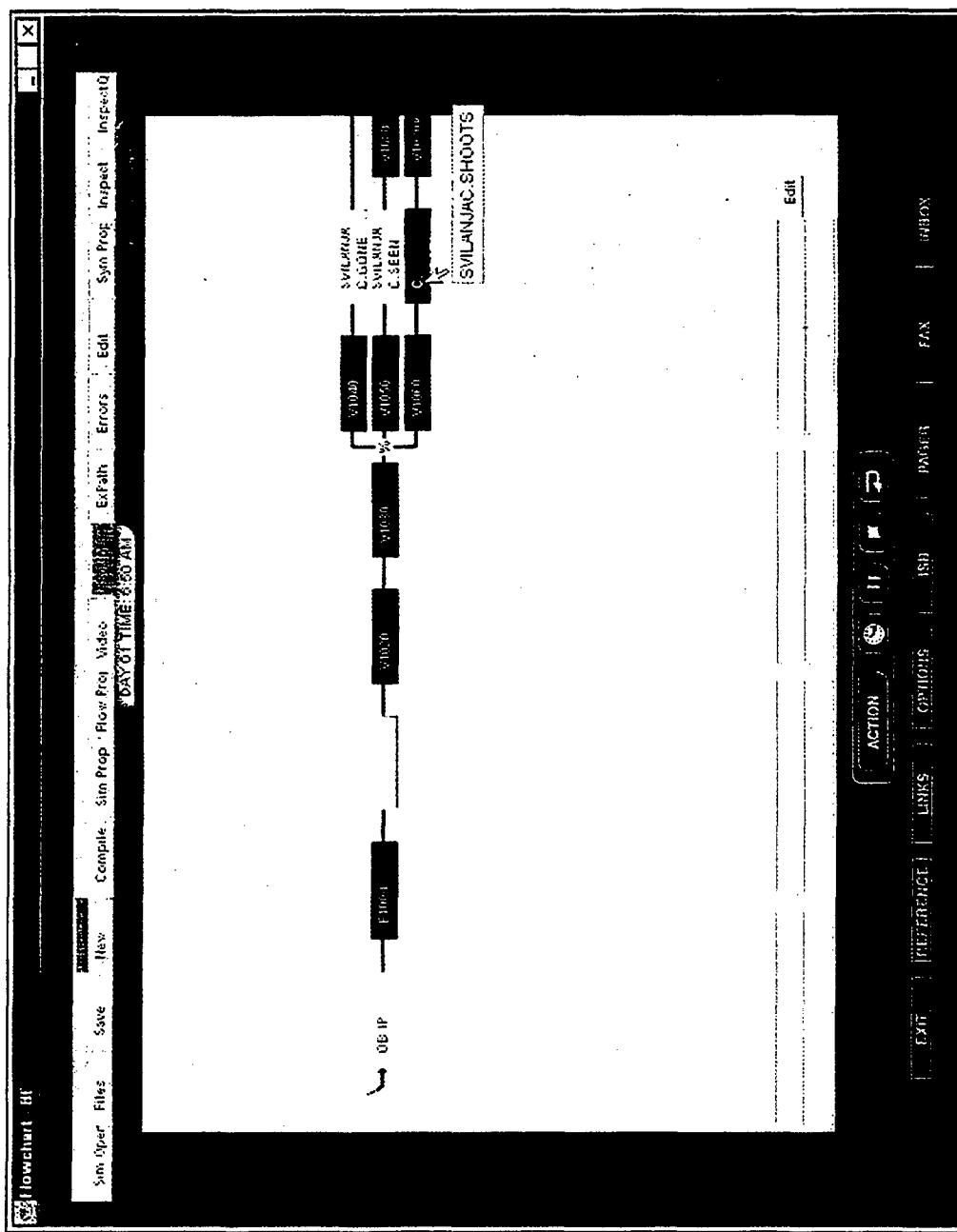


Figure 2. Screen Capture of PBif Tool Showing Consequence Tree

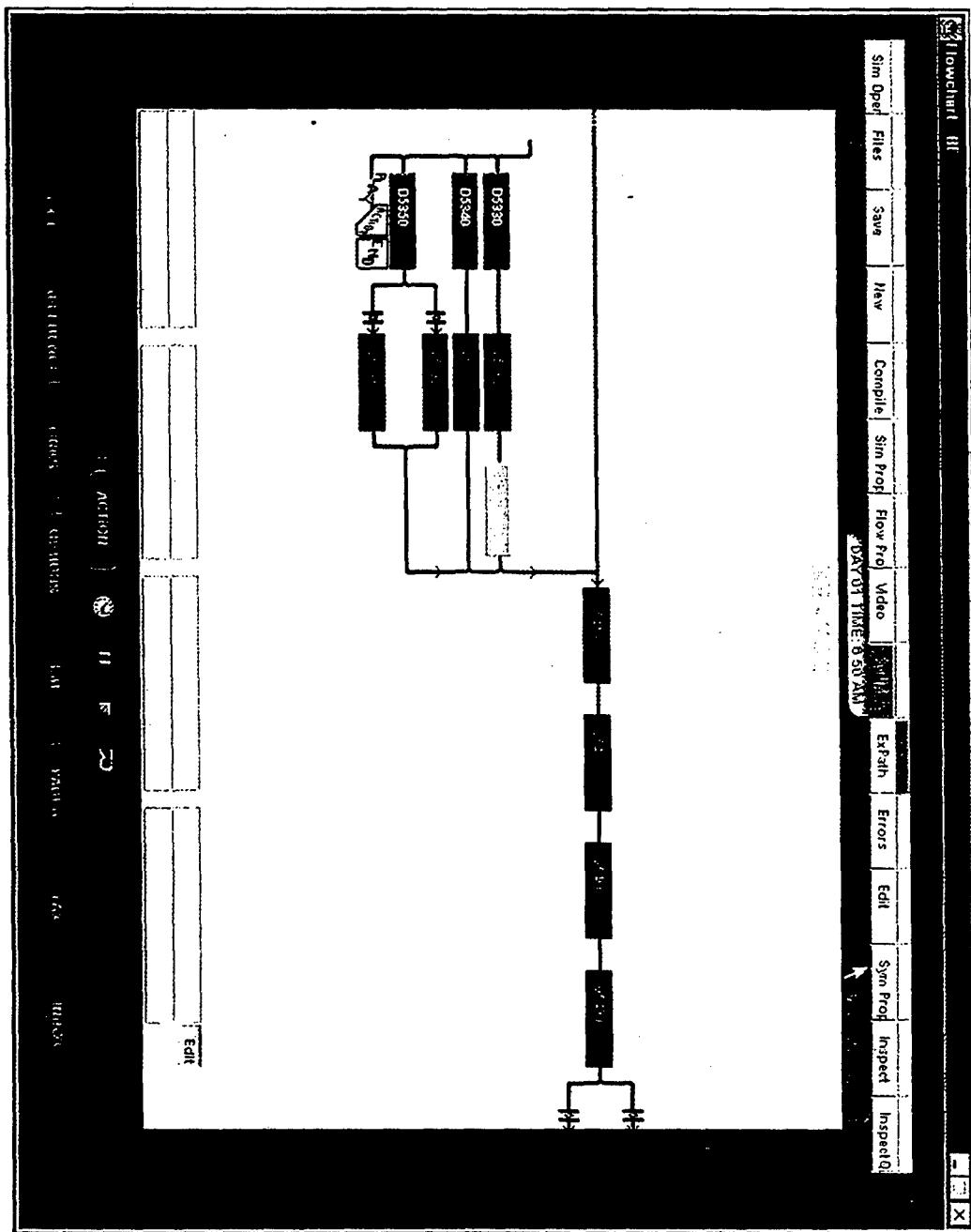


Figure 3. Unified Incident Command System

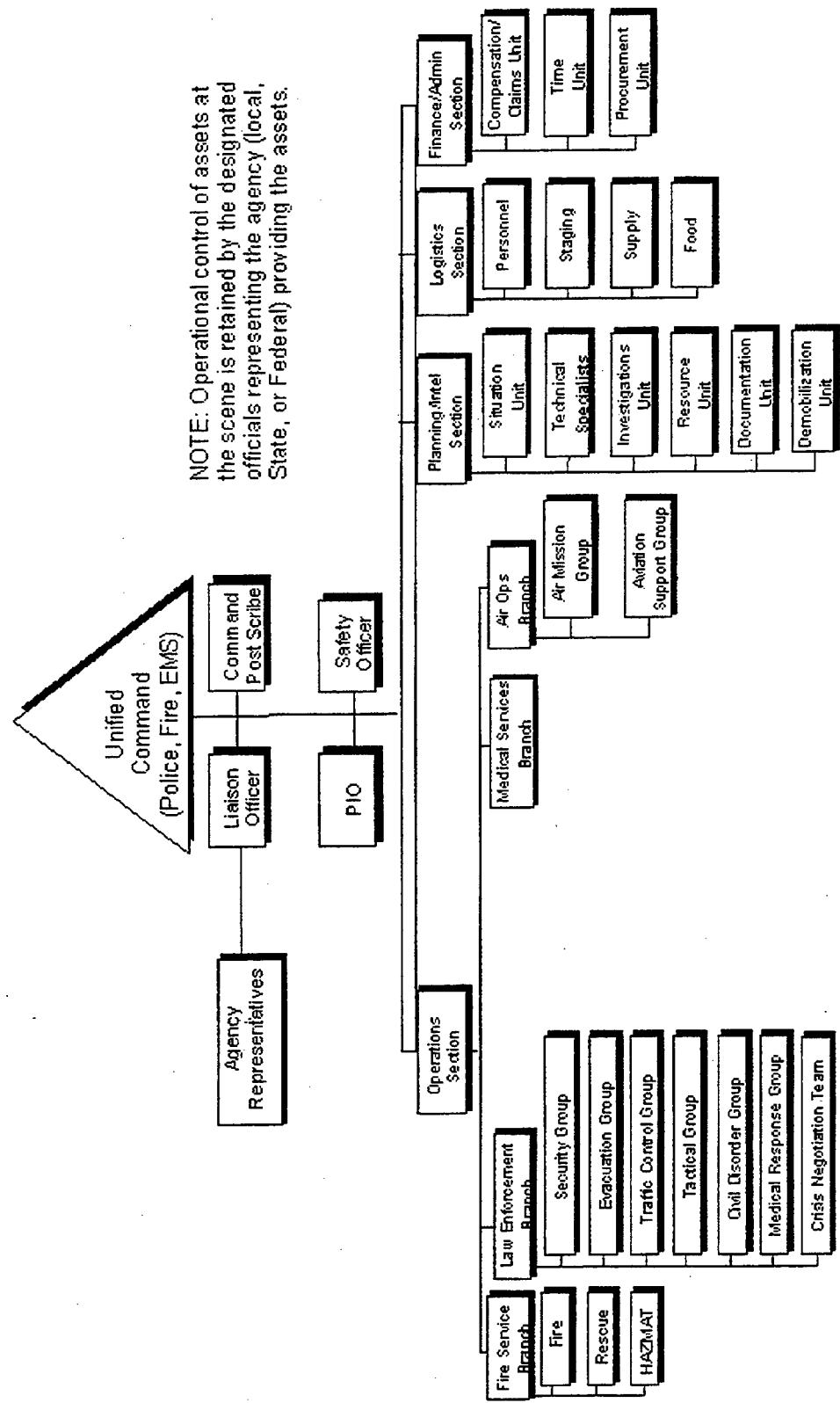


Figure 1 – Incident Command System / Unified Command